

IN THE DRAWINGS

Submitted herewith are replacement and red-lined copies of Figure 2 reflecting a change in the font style of element "W_{ss}" as requested by the Examiner.

REMARKS

The Examiner is thanked for the indication of patentability of claim 2.

Figure 2 has been amended to change the font style. The specification and claims 1-3, 14 and 17 have been amended to correct typographical errors.

Claims 1-19 are pending. No new matter has been added.

Claims 1, 3, 14 and 17 were objected to for informalities. The claims have been amended in accord with the Examiner's suggestions. Reconsideration and withdrawal of these objections are respectfully requested.

Claims 2, 12, 13, and 15 were rejected under 35 U.S.C. §112, second paragraph as being indefinite. Claim 2 has been amended to correct a typographical error. Regarding the other claims, the applicant respectfully traverses this rejection and requests reconsideration of the rejection in light of the following remarks.

The Official Action stated that "[t]he 'group consisting of linear actuators, direct drive modules and motor' is not given clear description in the specification and it is uncertain how they are used."

The present invention is an electromechanical training device that absorbs various blows from a user and reacts thereto while throwing punches and counter punches. See paragraph [0003]. The electromechanical training device is anatomically correct. It can throw punches, dodge punches thrown by a user, throw counter punches or assume alternative fighting styles. See paragraph [0017]. Actuators within the device cause the device to move with human-like movements. See paragraph [0018]. Programmable drive systems, such as

linear actuators and direct-drive modules, may be used for moving the various components and parts of the device. See paragraph [0024]. Control circuitry connects with motors or actuators to activate the torso and arms of the device. See paragraph [0035].

The terms linear actuators, direct drive modules or motors are cited throughout the specification and indicate that these elements are used to activate the torso and arms of the device such that an electromechanical sparring partner is realized. In this fashion, the electromechanical sparring partner can move its arms and torso to mimic a fighter. These terms are used in paragraphs [0018], [0024], [0028], [0035], [0036], [0050], [0051], [0052], [0054], [0055], [0056], [0058], [0059], [0060], [0061], and [0062]. The drawings also show the motors or actuators that operate the various parts of the invention.

A recent search of the United States Patent and Trademark Office's online patent database and publication database yielded the following results. Each term in quotes was entered into the patent and publication database. The term "motor" yielded 555,197 patents and 170,408 publications. The term "linear actuator" produced 8,636 patents and 3,580 publications. The term "direct drive module" produced 5 patents and 2 publications. Internet searches of these terms on Google and Ask.com yielded the respective results: "motor" - 490,000,000; 44,640,000; "linear actuator" – 683,000; 47,500; and, "direct drive module" – 83; 21.

Thus, the applicant respectfully submits that the invention has been described in adequate enough detail, when taken in conjunction with the state of

the present art, that the provided description clearly defines the metes and bounds of the claims while enabling a skilled artisan to practice the invention without undue experimentation. Withdrawal of the rejection is respectfully requested.

Claim 1 is rejected under 35 U.S.C. §102(b) as being anticipated by Genin, U.S. Patent No. 3,888,023.

Claims 6-9, 14 and 15 were rejected under 35 U.S.C. §102(b) as being anticipated by Wilson et al, U.S. Patent No. 4,819,934.

Claims 3, 4 and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Genin in view of Huang et al., U.S. Patent No. 6,871,115.

Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Genin in view of Huang and further in view of Wakaizumi et al., U.S. Patent No. 6,324,444.

Claims 10-13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wilson in view of Genin.

Claim 16 was rejected under 35 U.S.C. §103(a) as being unpatentable over Wilson in view of Paoletti, U.S. Patent No. 4,995,610.

Claim 18 was rejected under 35 U.S.C. §103(a) as being unpatentable over Wilson in view of Wilde, U.S. Patent No. 5,100,138.

Claim 19 was rejected under 35 U.S.C. §103(a) as being unpatentable over Wilson in view of Franey, U.S. Patent No. 5,803,877.

The instant invention is an electromechanical training device that throws punches, dodges punches thrown by a user, throws counter punches or

assumes alternative fighting styles. Actuators arranged within the device cause the device to move with human-like movements. Control circuitry connects with motors or actuators to activate the torso and arms of the device to mimic all movements of a fighter.

The applicants respectfully traverse all of the aforementioned rejections and submit that none of the cited references either singly or in combination yield a realistic fighting device as the present invention. Moreover, none of the devices teach or suggest all of the claimed elements of the present invention.

Independent claim 1, upon which claims 2-5 depend, recites an electromechanical sparring partner. The sparring partner includes a *base including legs that provide support such that the electromechanical sparring partner can throw and receive punches*. A torso connects to the base and includes a torso movement assembly for turning and tilting the torso about an axis. A right arm includes an upper and lower arm portion and connects to the torso. *The right arm further includes a right arm actuation assembly that raises, lowers, extends and retracts the right arm*. A left arm includes an upper and lower arm portion and connects to the torso. *The left arm further includes a left arm actuation assembly that raises, lowers, extends and retracts the left arm*. A controller connects to the torso movement assembly, the right arm actuation assembly, and the left arm actuation assembly and controls an operation of each assembly. A power supply provides power to said controller.

Regarding independent claim 1 and its rejection, it is respectfully submitted that the Genin is not an electromechanical sparring partner and cannot operate as one for several reasons. Genin fails to teach or suggest a

base including legs that provides support such that the electromechanical sparring partner can throw and receive punches. Genin also fails to teach a right arm including an upper and lower arm portion and connected to the torso, the right arm further including a right arm actuation assembly that raises, lowers, extends and retracts the right arm. Moreover, Genin fails to disclose a left arm including an upper and lower arm portion and connected to the torso, the left arm further including a left arm actuation assembly that raises, lowers, extends and retracts said left arm. Genin is also devoid of any disclosure of a controller connected to the torso movement assembly, the right arm actuation assembly, and the left arm actuation assembly and that controls an operation of each assembly.

Genin, U.S. Patent No. 3,888,023, discloses an automated manikin or robot having a humanoid appearance and programmed to operate as a physical training instructor for demonstrating a series of body-building exercises. See col. 1, lines 4-8. The robot 10 includes a pair of hollow legs 11 whose feet are anchored on the top wall of a pedestal 12 which houses a motorized cam mechanism. See col. 3, lines 15-19. It is clear that these legs cannot support the Genin device to either throw or receive punches. The motorized cam mechanism includes "a cam cylinder having a series of endless cam tracks, each producing a distinct program of callisthenic movements, the program being repeated with each full revolution of the cylinder." The robot is battery operated, includes an on/off switch 17 that is operatively linked to the motorized cam mechanism. The user can select which callisthenic movements that the robot

will perform by a selector switch 18. See col. 3, lines 40-54. The Genin device only demonstrates a series of body-building exercises and does not operate to as a sparring partner that throws and receives punches.

It is respectfully submitted that Genin is not a life-size, anatomically correct device that can both receive punches from a fighter and throw punches towards a fighter, as in the present invention. From the drawings it is apparent that the Genin device is a small device, perhaps only several inches in stature. Moreover, the arm assemblies of Genin, as shown in Figs. 2 and 3, cannot throw punches. See the exploded view in Fig. 7 of Genin which clearly shows that the arms are doll-type arms. *Genin does not include any actuator means in the arms for causing the respective arm to throw any punches.*

There are several other notable differences between the Genin device and claimed elements of the present invention. First, the Genin device cannot operate as a sparring partner because it lacks the capability of receiving or throwing punches. Second, the base of Genin does not provide support such that the Genin device can throw and receive punches.

With respect to independent claim 1 of the present invention, it is respectfully submitted that Genin does not teach or disclose all of the claimed elements. Namely, Genin fails to teach a sparring partner that includes a base including legs that provide support such that the electromechanical sparring partner can throw and receive punches. Genin also fails to teach a right arm including an upper and lower arm portion and connected to the torso. The right arm further includes a right arm actuation assembly that raises, lowers, extends

and retracts said right arm. Moreover, Genin fails to disclose a left arm including an upper and lower arm portion and connected to the torso. The left arm further includes a left arm actuation assembly that raises, lowers, extends and retracts the left arm. Genin is also devoid of any disclosure of a controller connected to the torso movement assembly, the right arm actuation assembly, and the left arm actuation assembly and for controlling an operation of each assembly. For at least these reasons, Genin neither discloses nor suggests all of the claimed elements of independent claim 1. Thus, reconsideration and withdrawal of the rejection of claim 1 is respectfully requested.

Regarding independent claim 6, upon which claims 7-13 depend, and independent claim 14, upon which claims 15-19 depend, it is respectfully submitted that Wilson does not disclose all of the claimed elements of these independent claims.

Independent claim 6, recites an anatomically correct electromechanical sparring partner including at least structural components of a head, a torso, at least one arm and a base. The sparring partner comprises *means for raising an arm connected to the torso, means for straightening and bending the arm connected to the torso, means for tilting the torso, and means for twisting the torso*. Figures 4A through 4E show an arm actuation assembly that comprises two motors for raising and lowering the shoulder, as well as extending and retracting the lower arm. See paragraph [0060]. A selective engagement yoke 107 is provided for allowing the arm to throw a variety of different punches. Moreover, the arm assembly includes a motor mounted onto a movable or rotating motor mount plate to cause the shoulder and arm to be raised. See paragraph

[0065]. The arm actuation assembly of the present invention includes the yoke and movable motor mount to thereby allow the instant invention to assume a variety of positions for throwing various punches. It is respectfully submitted that Wilson neither discloses nor suggests all of the claimed elements of the present invention.

The instant invention includes actuation assemblies that allow the torso of the present invention to tilt, twist, and move in a side-to-side manner. Moreover, the instant invention includes a variety of motor or actuators that allow each arm to be independently raised. Wilson fails to disclose a torso that tilts and moves in a side-to-side manner as well as the arm assembly.

Claim 14 discloses an electromechanical sparring partner for throwing an array of punches towards a fighter. The electromechanical sparring partner comprises a *torso that both twists about an axis and tilts with respect to the axis*. Wilson does not tilt about its axis. In fact, Wilson actually teaches away from a torso that tilts with respect to an axis, to do so would be very detrimental to Wilson and cause the belt 23 to be thrown off to cause breakage of the machine.

Claim 14 further includes claimed elements of arms connected to the torso. *The arms raise, extend and retract such that a variety of punches may be thrown by the robotic sparring partner.* Wilson can only throw one type of punch from each hand and cannot, for example, throw an upper cut or a right-cross. The various actuators or motors connected to the arm in the present invention allow the elbow and shoulder of the arm to be raised for throwing a variety of punches.

Wilson et al, U.S. Patent No. 4,819,934 discloses an exercise machine including articulated arms which moves between a retracted cocked position and

an extended punching position to simulate the throwing of a punch. Referring to Fig. 1, the Wilson machine includes a fixed portion 12 having a platform 16 extending therefrom. A motor 20 is arranged atop platform 16 and includes a first sprocket 21 attached at an end of an output shaft 22. A second sprocket 23 is attached to the rotating portion 14. A thrust bearing 18 is arranged between the fixed portion 12 and the rotating portion 14 to allow the rotating portion 14 to rotate relative to the fixed portion. This rotational motion causes the arms 28 to extend and retract in opposite directions to one another. It is clear that Wilson can only throw one punch from each arm. As such, *Wilson does not throw a variety of punches* as in the present invention. Thus, the claimed elements of the present invention are not the same as those in Wilson.

Regarding the rejection of the claims as being unpatentable under 35 U.S.C. §103, it is respectfully submitted that none of the cited references include a suggestions or motivation for teaching all of the claimed elements of the independent claims. As such, the references fail to all of the claimed elements of the present invention.

Regarding the rejection of claims 3, 4 and 17, Genin is deficient in its teachings for at least the reasons cited above. Huang discloses a method and apparatus for monitoring the operation of a semiconductor wafer handling robot. It is respectfully requested that semiconductor wafers are delicate, lightweight and typically small in nature. Huang fails to disclose an electromechanical sparring partner and cannot operate as one for several reasons. Huang fails to teach or suggest a *base including legs that provides support such that the*

electromechanical sparring partner can throw and receive punches. Further, Huang fails to teach a right arm including an upper and lower arm portion and connected to the torso, *the right arm further including a right arm actuation assembly that raises, lowers, extends and retracts the right arm.* Moreover, Huang fails to disclose a left arm including an upper and lower arm portion and connected to the torso, *the left arm further including a left arm actuation assembly that raises, lowers, extends and retracts said left arm.* Huang is also devoid of any disclosure of a *controller connected to the torso movement assembly, the right arm actuation assembly, and the left arm actuation assembly and that controls an operation of each assembly.*

Huang fails to disclose an electromechanical sparring partner for throwing an array of punches towards a fighter. Huang also fails to disclose an electromechanical sparring partner that comprises a *torso that both twists about an axis and tilts with respect to the axis along with arms that raise, extend and retract such that a variety of punches may be thrown by a robotic sparring partner.* As such, Huang cannot be used to overcome the deficiencies of Genin. Thus, any resultant combination of Genin and Huang fails to disclose all of the claimed elements of the invention.

Regarding the rejection of claim 5, it is respectfully submitted that Genin and Huang fail to teach or suggest all of the claimed elements of independent claim 1. Wakaisumi cannot be relied upon to cure these deficiencies.

Wakaisumi discloses a robot with multi-joint arms movable in a horizontal plane. Wakaisumi fails to disclose an electromechanical sparring partner and

cannot operate as one for several reasons. Wakaisumi fails to teach or suggest a base including legs that provides support such that the electromechanical sparring partner can throw and receive punches. Further, Wakaisumi fails to teach a right arm including an upper and lower arm portion and connected to the torso, the right arm further including a right arm actuation assembly that raises, lowers, extends and retracts the right arm. Moreover, Wakaisumi fails to disclose a left arm including an upper and lower arm portion and connected to the torso, the left arm further including a left arm actuation assembly that raises, lowers, extends and retracts said left arm. Wakaisumi is also devoid of any disclosure of a controller connected to the torso movement assembly, the right arm actuation assembly, and the left arm actuation assembly and that controls an operation of each assembly. As such, Wakaisumi cannot be relied upon to cure the deficiencies of either Genin or Huang.

Regarding the rejection of claims 10-13, it is respectfully submitted that neither Wilson nor Genin teach or disclose all of the claimed elements of independent claim 6, upon which claims 10-13 depend. Independent claim 6, recites an anatomically correct electromechanical sparring partner including at least structural components of a head, a torso, at least one arm and a base. The sparring partner comprises means for raising an arm connected to the torso, means for straightening and bending the arm connected to the torso, means for tilting the torso, and means for twisting the torso. Neither Wilson nor Genin disclose or suggest all of these claimed elements.

Regarding the rejection of claim 16, it is respectfully submitted that Wilson is deficient for the reasons mentioned above with respect to independent claim 14. Paoletti cannot be relied upon to cure the deficiencies of Wilson. Paoletti discloses an electric boxing machine having two opposed dolls. Independent claim 14 discloses an electromechanical sparring partner for throwing an array of punches towards a fighter. The electromechanical sparring partner comprises a torso that both twists about an axis and tilts with respect to the axis. Neither Wilson nor Paoletti discloses a torso arranged in this manner. Moreover, both of these references fail to disclose or suggest arms that raise, extend and retract such that a variety of punches may be thrown by the robotic sparring partner.

Regarding the rejection of claim 18, it is respectfully submitted that neither Wilson nor Wilde teach or disclose all of the claimed elements of independent claim 14. Wilde cannot be relied upon to cure the deficiencies of Wilson. Wilde discloses a motorized mobile boxing robot that carries a person and is articulated and controlled with joysticks or foot pedals. Wilde fails to teach or suggest all of the claimed elements of independent claim 14, upon which claim 18 depends. Independent claim 14 discloses an electromechanical sparring partner for throwing an array of punches towards a fighter. The electromechanical sparring partner comprises a torso that both twists about an axis and tilts with respect to the axis. Neither Wilson nor Wilde discloses a torso arranged in this manner. Moreover, both of these references fail to disclose or suggest arms that raise, extend and retract such that a variety of punches may be thrown by the robotic sparring partner.

Regarding claim 19, it is respectfully submitted that neither Wilson nor Franey teach or disclose all of the claimed elements of independent claim 14, upon which claim 19 depends. Independent claim 14 discloses an electromechanical sparring partner for throwing an array of punches towards a fighter. The electromechanical sparring partner comprises a torso *that both twists about an axis and tilts with respect to the axis*. Neither Wilson nor Franey discloses a torso arranged in this manner. Moreover, both of these references fail to disclose or suggest *arms that raise, extend and retract such that a variety of punches may be thrown by the robotic sparring partner*.

It is respectfully submitted that none of the cited references either singly or in combination teach or suggest all of the claimed elements of independent claims 1, 6 and 14. Applicants strongly submit that the subject matter which distinguishes the present invention from the cited prior art is more than sufficient to render the claimed invention unobvious to a person of ordinary skill in the art. Applicants therefore respectfully request that all of the pending claims be found allowable, and this application be passed to issue.

Withdrawal of all of the aforementioned rejections is respectfully solicited. If for any reason, the Examiner determines that the application is not currently in condition for allowance, that the Examiner contact by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

Respectfully submitted,



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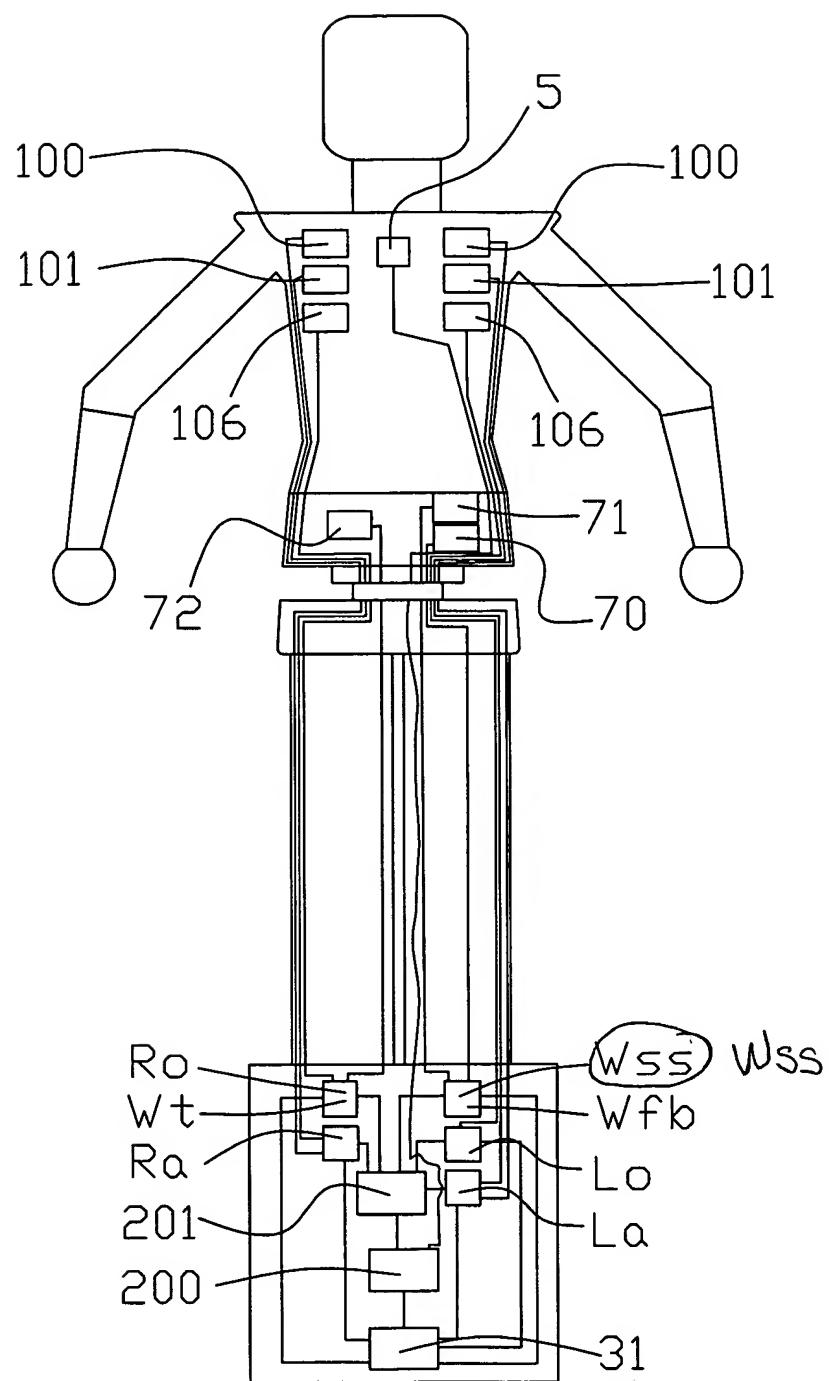


Figure 2